



UNITED STATES PATENT AND TRADEMARK OFFICE

fw
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,363	06/26/2003	Ross Cutler	MSC-014-03	2917
7590	04/17/2007		EXAMINER	
Katrina A. Lyon LYON & HARR, LLP Suite 800 300 Esplanade Drive Oxnard, CA 93036			REKSTAD, ERICK J	
			ART UNIT	PAPER NUMBER
			2621	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/17/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/608,363	CUTLER, ROSS
Examiner	Art Unit	
Erick Rekstad	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 06 March 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-25 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-25 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 06 March 2007 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

This is a Final Rejection for application no. 10/608,363 in response to the amendment filed March 6, 2007 wherein claims 1-25 are presented for examination.

Response to Arguments

Applicant's arguments filed March 6, 2007 have been fully considered but they are not persuasive. The Applicant argues that Nalwa does not teach the camera system uses the N-sided mirror to create a camera array with a very small distance D between the virtual centers of projections of the cameras in the array. This distance D is non-zero value, however.

The Examiner respectfully disagrees. The requirement that the distance D is a non-zero value is not presented in the claims. Therefore the argument by the Applicant that Nalwa only teaches the use of the same virtual center does not overcome the rejection. The same virtual center would mean a small distance between virtual centers.

Response to Amendment

The amendment filed March 6, 2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendment attempts to change the equation for determining C'_{dist} by adding the use of the absolute value of $(C'_x \cdot M_x)$. The amendment further changes the equation of B2 from $B+H/\tan(\alpha)$ to $(B+H)\tan(\alpha)$. The new equations drastically change the scope of the specification.

Applicant's statement that such equations would be readily recognized by someone with ordinary skill in the art is insufficient. Further, it is noted that the specification section the Applicant is attempting to amend starts on page 17.

Applicant is required to cancel the new matter in the reply to this Office Action.

Drawings

The drawings were received on March 6, 2007. These drawings are not acceptable. The new drawing lacks the identifier C' shown in the original Fig. 4. Further, identifier VFOV should be presented as shown in the original Fig. 4 for clarity.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-9, 13, 14, 17, 19, 20, 22, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,128,143 to Nalwa.

[claims 1, 7, 13]

As shown in Figures 2 and 7, Nalwa teaches a camera system comprising an N-sided reflective surface (40) and N cameras (52,54,56 and 58) (Col 3 Lines 53-63). Nalwa further teaches the cameras are aligned so that they have the same virtual center (Col 4 Lines 11-38). Nalwa further teaches the use of an image stitcher (Mux 170 in Figure 7) for stitching each of said reflected images taken by adjacent cameras together to create a panoramic image (Col 6 Lines 1-21).

[claims 2, 3, and 19]

As shown in Figure 2, the cameras are tilted upward (90 degrees) relative to the horizontal to capture an increased vertical field of view. Nalwa further teaches the tilted cameras and mirrors in order to provide a 360 degree view of a scene as required by claim 3 (Abstract, Col 4 Lines 3-38).

[claims 5 and 20]

Nalwa further teaches the use of a mounting rod as shown in Figures 17-19. Figures 18 and 19, teach the mounting rod positioning said N-sided reflective surface above said N cameras each associated with a different side of said N-sided reflective surface (Col 11 Line 54-Col 12 Line 26).

[claim 6]

As shown in Figures 14 and 18, Nalwa teaches the positioning said N-sided reflective surface above said N cameras increases said vertical field of view of said N cameras (Col 10 Lines 1-6).

[claims 8, 9 and 17]

Nalwa further teaches the calibrating of the surface using a constant depth (Col 12 Line 47-Col 13 Line 4, Fig. 21). Nalwa teaches the use of the predefined test pattern (930 in Figure 21) for the calibrating as required by claim 9.

[claim 14]

Nalwa further teaches the cameras are image gathering devices such as an optical scanner (Col 3 Lines 62-63).

[claim 22]

Nalwa further teaches the use of a microcontroller for controlling the operation of the system (Col 6 Lines 13-18 and Lines 29-32).

[claim 23]

Nalwa teaches the cameras capture a 360 degree image (Abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nalwa.

[claim 24]

Nalwa teaches the requirements of claim 22, Nalwa further teaches providing a means of building a viewer which does not provided a full 360 degree viewing (Col 5 Lines 45-51). It would have been obvious to one of ordinary skill in the art at the time of the invention to build a view with a total coverage of 180 as this is a coverage less then 360 degrees (Official Notice).

Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nalwa as applied to claims 8 and 13 above, and further in view of US Patent 6,677,981 to Mancuso et al.

[claims 10 and 16]

As shown above for claim 9, Nalwa teaches the use of a predetermined calibration surface (930 in Figure 21) (Col 12 Line 47-Col 13 Line 4, Fig. 21). Nalwa does not teach the use of a user defined calibration surface.

Mancuso teaches a panoramic imaging system that provides the user the images and allows the user to define the calibration surface by determining how to combine the images (Col 8 Line 55-Col 9 Line 24, Fig. 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the calibration process of Mancuso in place of the calibration of Nalwa in order to allow the user to determine how to produce the panoramic images.

Claims 11, 12, 15, 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nalwa as applied to claims 8, 13 and 22 above, and further in view of US Patent 7,015,954 to Fonte et al.

[claims 11 and 12]

As shown above, Nalwa teaches the requirements of claim 8. Nalwa further teaches the images are a cylindrical arrangement which is displayed on a flat display (Col 2 Lines 16-Lines 28, Col 7 Lines 37-48, Figs 8 and 9). Nalwa does not teach the method of combining the images as claimed in claim 11.

As shown in Figure 6, Fonte teaches the calibrating and image stitching of images obtained by multiple cameras in order to provide a seamless panoramic image (Col 9 Lines 4-19, Figs 6 and 7). The stitching includes the marking of the images (ABCD, Fig 7) and the creating of a mapping table to alter the images (Col 10 Lines 1-6). It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the stitching method of Fonte with the imaging means of Nalwa in order to provide a seamless stitching means as taught by Fonte. In regards to claim 12, Fonte specifically teaches the use of the mapping table for new images as once the table is determined the camera location does not change (Col 10 Lines 1-6).

[claim 15]

As shown above, Nalwa teaches the requirements of claim 13. Nalwa does not teach the use of table edges for defining the calibration surface. Fonte teaches the creating of a mapping table based on images input as shown above for claims 11 and 12. Fonte further teaches the placing of the camera assembly on a conference table (Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the stitching method of Fonte with the imaging means of Nalwa in order to provide a seamless stitching means as taught by Fonte. It would have further been obvious to one of ordinary skill in the art at the time of the invention that the images used to create the mapping table would include the table edges if the assembly was placed on the table as suggested by Fonte (Fig. 3) because the surrounds of the camera assembly would include the table.

[claims 18 and 25]

As shown above Nalwa and Fonte teach the requirements of claim 11. Nalwa further teaches the requirements of claim 13. Nalwa is silent on the use of LED patterns for calibrating the cameras. Fonte teaches the calibrating of the cameras by using an LED pattern to determine image points viewed by multiple cameras and adjusting based

on these points (Col 17 Line 29-Col 18 Line 8). Note specifically Col 18 Line 5 where Fonte states the use of LEDs. Fonte specifically teaches the use of such a calibration in order to overlap images (Col 17 Line 29-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the calibration of Fonte with the system of Nalwa in order to provide a panoramic image as taught by Fonte.

Claims 4 and 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nalwa as applied to claim 19 above, and further in view of US Patent 7,116,351 to Yoshikawa.

[claim 4]

As shown above, Nalwa teaches the requirements of claims 1 and 3. Nalwa is silent on the tilting of the cameras. Yoshikawa teaches a similar omnidirectional imaging device as Nalwa (Col 1 Lines 14-24, Fig. 1). Yoshikawa teaches the tilting of the cameras with an angle of less than 45 degrees in order to reduce the size of the imaging device (Abstract, Col 5 Lines 43-49 and Line 64-Col 6 Line 9, Fig. 3). It would have been an obvious to one of ordinary skill in the art at the time of the invention to combine the angled cameras of Yoshikawa with the imaging device of Nalwa in order to reduce the size of the imaging device as taught by Yoshikawa. It would have further been obvious to select an angle of the cameras at any angle below 45 degrees as a design choice with relation to the desired reduction in size of the imaging device.

[claim 21]

Nalwa teaches the tilted upward of each camera as shown for the rejection of claim 19 (Fig. 2). Yoshikawa teaches a similar design as shown in Figure 1.

Yoshikawa further teaches an alternative embodiment wherein the camera and camera lens are tilted in order to reduce the size of the imaging device (Abstract, Col 5 Lines 57-Col 6 Line 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Yoshikawa with the imaging device of Nalwa in order to provided an imaging device with a reduced size.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Rekstad whose telephone number is 571-272-7338. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erick Rekstad
Examiner
AU 2621
(571) 272-7338
erick.rekstad@uspto.gov

er

SO-AEJ
GIMS PHILIPPE
PRIMARY EXAMINER